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ABSTRACT OF THE DISCLOSURE

A method and associated apparatus for in-process automated analysis employing a modified form of isotope dilution mass spectrometry is disclosed. It involves elemental and speciation threshold measurement that is optimized for  
5 quality assurance at and is capable of functioning at and near quantitative instrumental detection limits. The system is automated and may be employed in an unattended operation for identification and quantification of elemental or specie contaminants. In a preferred aspect of the method, a sample is subjected to equilibration with at least one spiked enriched stable isotope element or specie after  
10 which it is subjected to ionization in an atmospheric ion generator and processed by a mass spectrometer with the output of the mass spectrometer being processed by a microprocessor which through a controller coordinates operation of sample and spike delivery and equilibration as well as the operation of the atmospheric ion generator and mass spectrometer. The method may in the alternative be employed  
15 qualitatively.